# *Appendix Three*

## Prevalance and Risk Factors of Self-Perceived Hypersensitivity to Electromagnetic Fields in California

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# PREVALENCE AND RISK FACTORS OF SELF-PERCEIVED HYPERSENSIVITY TO ELECTROMAGNETIC FIELDS IN CALIFORNIA

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# ABSTRACT

Cases of hypersensitivity to electromagnetic fields (EMF) have been reported for more than 20 years but no population-based study has been done on this subject. The etiology of this mostly self-reported disorder is unclear but some authors have suggested some connection with the “multiple chemical sensitivity” illness. We report the results of a telephone survey among a sample of 2072 Californians. Being “allergic or very sensitive” to getting near electrical devices was reported by 68 subjects (3.2%). Characteristics of the people reporting hypersensitivity to EMF were generally different from those reporting being allergic to “everyday chemical”. Having been told by a doctor having “environmental illness or multiple chemical sensitivity” was the strongest predictor of reporting being hypersensitive to EMF: adjusted Prevalence Odds Ratio (POR) = 5.8, 95 % CI 2.6-12.8. Other factors apart from self-reporting chemical sensitivity were: being from another race/ethnicity than white, black or Hispanic (POR=4.9, 95% CI 2.3-10.7), or having low income (POR=2.4, 95% CI 1.1-5.2). This study confirms the presence of this self-reported disorder in North America. While the methodology used has some important limits, the result of this study supports the need for a deeper evaluation of this potential health problem.

key words: hypersensitivity, electric and magnetic fields

## INTRODUCTION

Hypersensitivity to electric and magnetic fields (HSEMF) has been described in the literature for nearly 20 years (1). Most of the reported literature, mainly from Northern Europe, consists of case studies and limited population studies carried out in occupation settings (2). The published data concern essentially some non specific dermatological symptoms mainly subjective (itching, burning, stinging, etc) and associated with video display terminal (VDT) work (3-4). More recently, a general clinical portrait has been described in which neurasthenic symptoms (dizziness, fatigue, headache, difficulties in concentrating, etc.) seem to dominate along with non-specific skin disorders, ocular, gastro-intestinal or respiratory symptoms (5, 6, 1). The common feature of this self-reported health disorder is its acute occurrence with proximity to electrical devices including certain power lines and its disappearance when the source is off or not nearby. Also striking is its variable severity ranging from very mild symptoms to major impairment resulting in increased work absences and eventually unemployment (1).

Few papers have been published on this issue in North America. Most are short review papers based on European literature (7-9), and a few case reports (10,11). Based on the European Commission working group survey (1), the prevalence of HSEMF is rare (from less than a few per million to a few tenths of a percent). However, this range of prevalence was estimated by questionnaire sent to occupational and environmental clinics as well as to support groups. In fact, to date, no population-based studies for HSEMF have been published.

The literature reports a weak if any association of hypersensitivity with electric and magnetic field exposures (1, 12, 13). In fact, most of the provocation studies have been negative (1). In particular, in blind exposure experiments, HSEMF subjects were not able to detect the presence of the fields at low intensities (14-15). Therefore, HSEMF has been sometimes considered a subset of a more general "environmental illness" as multiple chemical sensitivity (11, 16). Other authors have suggested that it is a manifestation of somatization or conversion of stress (17) but its association with perception of risk has not been studied.

As a result of this limited knowledge, a population-based study was done to fill some of these gaps to help California Health Officials understand HSEMF as a potential health problem. The main objective of this study was to estimate the prevalence of self reported HSEMF in a random sample of adult Californians. It was also aimed at describing the characteristics of people reporting HSEMF as well as exploring its possible association to self-reported chemical sensitivity (SRCS) and medically diagnosed chemical sensitivity (MDCS).

## METHODS

### *General method and population*

This study is based on questions added from July 1998 to December 1998 to the 1998 California Adult Tobacco Survey (CATS) . This survey is an ongoing monthly telephone survey that collects information on tobacco use and other health related behaviours on a representative sample of the adult Californian population. A screened random digit dial

(RDD) sample purchased from a commercial sampling firm was used (18). Once a household was reached, all the persons living in the household aged 18 years and older are enumerated and, if more than one is eligible, a computer-generated random selection algorithm was used to select the participant.

*Questionnaire*

Questions regarding EMF and chemical sensitivity were added at the end of the questionnaire of the CATS. HSEMF was defined as being "allergic or very sensitive to getting near electrical appliances, computers or power lines". SRCS was defined as considering oneself as "allergic or unusually sensitive to everyday chemicals" and MDCS as being "told by a doctor that you had environmental illness or multiple chemical sensitivity". Self-reported history of asthma and hay fever as well as reported perception of risk from EMF was also assessed for each participant. A source of EMF (either distribution power line or hair dryer) was considered risky for the participant if he or she agrees that "it could cause (either definitely or not) some disease". And it was defined as not risky if the participant considered that it was "definitely or probably safe". Others variables, extracted from the general CATS questionnaire, were age, gender, race, education, health plan coverage, employment status, and family income.

*Data analysis*

Prevalence rates were estimated using direct adjustment, with weights for age, gender and race, derived from the 1997 California Department of Finance population estimates of the 1998 California population (18). Characteristics associated with HSEMF were compared

to those associated with SRCS to assess the similarities between the two conditions. Comparisons of proportions were done with chi-square analysis and Fisher exact test (2x2 tables). Factors associated with self-reported HSEMF were identified in crude analysis and then evaluated by multivariate logistic (19). Estimation of Prevalence odds ratios (POR) are presented with 95 % confidence intervals (95%CI) and p values < 0.5 (bilateral test) are considered as statistically significant.

RESULTS

2072 adults were interviewed for this study. The upper bound of the response rate (proportion of eligible households contacted which had a completed interview) was 84.1%. The response rate calculated according to the Council of American Survey Research Organization (20) was 58.3%. This method assumes that a proportion of households that could not be contacted represent potential eligible households. General characteristics of the 2072 participants, in comparison with the 1990 California census, are presented in Table 1. The study sample was different than the California population for some characteristics. Especially, the study sample had more females and was slightly older than the California census population. This confirms the need to provide adjustment for the estimation of the prevalence of health disorders in the California population.

Among the 2072 participants, 68 reported HSEMF resulting in a crude prevalence of 32.8 per 1000. Adjusted prevalence of self reported HSEMF was 32.4 per 1000 (95 % CI: 28.0 - 36.8). Mean age of subjects reporting HSEMF was 43.4 years (range: 18 – 85) and

mean duration of symptoms was 18.5 years (range: 1-55). Adjusted prevalence of people reporting HSEMF associated with necessity to change job or to remain unemployed was 5.2 per 1000 (95 % CI: 3.7 - 6.7). Among the 2063 participants who answered to questions on chemical sensitivity (9 did not respond), 503 (24.4%) self-reported chemical sensitivity (SRCS) of which 41 had also reported HSEMF. Adjusted prevalence of SRCS was 230.8 per 1000 (95 % CI: 221.9 -239.7) and lifetime prevalence of medically diagnosed chemical sensitivity (MDCS) was 33.9 per 1000 (95 % CI: 30.3 - 37.5).

As there was some overlap between HSEMF and SRCS, we first compared the characteristics of participants reporting HSEMF to those not reporting it among the subjects reporting SRCS (Table 2). Several differences were striking between the two groups. Compared to those reporting no HSEMF, the HSEMF group had less whites and more Hispanic or other races, were less likely to have health insurance plan, had lower incomes, were most likely to be unemployed, were less likely to report asthma and were more likely to report MDCS.

Second, we compared (Table 3) those reporting HSEMF regardless of SRCS or not (n=68) to those reporting only SRCS (n=446) . As found for the first comparison, the HSEMF group differed similarly from the SRCS group with respect to race, heath insurance coverage, income, employment, asthma and MDSC. In addition, the HSEMF group had less females and was less likely to have hay fever history than the SRCS group. Therefore, even if there were some overlap between self reported HSEMF and SRCS, these two disorders appear to be generally reported by different types of people.

HSEMF was then considered as the dependent variable and multiple logistic analysis was conducted to evaluate factors associated with it. As age was not mentioned as a key variable in the published literature and was not associated with HSEMF in the crude analysis (p=0.83), it was removed for (from ?) further analysis. These results are presented on Table 4 along with crude results. Both having self-reported SRCS or MDCS were the strongest associated factors for HSEMF: POR = 3.6 and 5.8 respectively. This confirms the association between the two health disorders. The other factors associated with HSEMF were: being unable to work (POR=3.8), earning less than 15,000 $ per year (POR=2.4) and being from another race than black, white, or Hispanic (POR=4.9).

Since risk perception for different EMF sources were very correlated, the effect of perception of risk from power lines, distribution lines or hair dryer were then considered separately (Table 5). Perception of risk from hair dryer was found to be the most strongly risk factor associated with self-reported HSEMF: POR=2.4 (95% CI: 1.2-4.9). Possible modification effect of risk perception was evaluated by stratification. None of the three indicators of EMF risk perception were found significant modifiers (using Breslow-Day test) of the associations described previously. Finally, the possible confounding effect of risk perception was also evaluated. Association of self-perceived HSEMF with specific person characteristics remained quite stable after considering perception of risk to EMF, therefore confirming that perception of risk was not an explanation for the found associations with race and low income.

DISCUSSION

Self perceived electrical hypersensitivity has been described for a long time in the European literature but mainly based on case studies. This population-based study demonstrates that the prevalence of people reporting to be hypersensitive (HSEMF) to electric and magnetic fields exposure (3.2%) is not at all negligible as previously reported. Extrapolated to the total adult 1998 California population, it can be estimated that around 770, 000 people perceived that they are HSEMF. Extrapolation to the total 1998 California population for those who had to change jobs as a result of HSEMF is still not small, with an estimate of 120,000 of adult Californians.

Strengths of this study should be underlined. First, to our knowledge, this is the first population based study on EMF hypersensitivity. Inclusion of specific questions in a well-designed prevalence survey (18) results in a survey of a random sample of the California population. Second, we specified in the HSEMF questions the main sources of EMF reported as potential sources of this disorder (electrical appliances, computers or power lines) as identified by the European working group (1). Therefore the reported HSEMF can be compared to previous report results. Finally, we were able to compare HSEMF with self-perceived chemical sensitivity (SRCS) to assess similarities between the two conditions since we added specific questions on chemical sensitivities to the survey.

Weaknesses of the study should also be acknowledged. First, the condition is self-reported and was not clinically validated. This may inflate the real number of cases.

However published literature has also relied on self-reported HSEMF since there is no clear clinical diagnostic criteria for the condition (2). Second, one may also wonder if the sample is representative of the adult California population. While there was some discrepancy regarding age and gender status of the respondents compared to population data, we were able to adjust for those variables when estimating the prevalence of the conditions. The response rate (58-84 %) was very acceptable for such a study, but it always possible that some subclasses of the California population were less represented in the sample. Particularly, it is well known that those responding to telephone surveys are more educated than non-responders (21). This is also true to some extent with responders in the present CATS survey (18). This should be considered in interpreting the results of this study since the reported HSEMF was associated with a lower socio-economic status.

We can only compare our data with the estimation done by the European commission group for Europe (1) since this is the closest to a population-based approach. That study was based on a questionnaire sent to 138 centres of occupational medicine (COMs) and similar centres and 15 support groups from 15 different European countries. Its objective was to estimate the prevalence of HSEMF in Europe. Response rates were low (49 % for COMs) and questions were subjective, based respondent's estimation of the total number of cases in the country of the COM by respondents. The estimated prevalence of HSEMF was from less than a few per million to a few tenth of a percent using as denominators the total of the population of each studied country and the median of the estimation of the number of cases per country as numerator. The occurrence of severe cases was estimated

to be one order of magnitude lower. Those estimations are well below what we report in our study. These may be underestimations since they are based on cases having had a contact with either an occupational clinic or a self-aid group and hence have not captured those individuals not actively contacting these groups. Compared to the European group estimation, our estimate is 10 times higher for the total of cases as well as for the severe cases (those having to change job or stop working as a result of this condition).

Our study indicates that self-perceived HSEMF and SRCS may be different conditions. Despite some important overlap between the two diseases, SRCS was much more prevalent than reported HSEMF and subjects reporting only chemical sensitivity were different from those reporting SRCS plus HSEMF. Furthermore, there was a clear difference between subjects reporting HSEMF from those reporting SRCS without HSEMF. In particular, differences in gender and allergic status were striking. The overrepresentation of female in patients reporting chemical sensitivity has been described several times (22). It was found particularly in California for self-reported chemical sensitivity but not for physician-diagnosed chemical sensitivity (23). No association between reported HSEMF and gender was found in this study. The positive association between multiple chemical sensitivity and allergic status (particularly with asthma) is well known (23) but was not found for people reporting HSEMF (in fact a negative association was found with asthma).

Although the two self-reported diseases appear to be different, chemical sensitivity (either self-reported or medically-diagnosed) was found as an important risk factor for

HSEMF. The association between the two diseases has been proposed by authors based mainly on pragmatically grounds: the two have common non specific symptoms (17) and symptoms of sensitivity to electrical devices were reported by chemical sensitive patients (12).

Apart from self-reported and medically diagnosed chemical sensitivity, three other factors were associated with reporting HSEMF after adjustment for co-variables: being unable to work, from another race than black, white or Hispanic, and low income. Being unable to work might be a consequence of the disorder for the more severe cases. Being from other race than black, white or Hispanic was a surprising risk factor. In California this group is mainly composed of Asians and other ethnic minorities. No explanation was found for such an association but this should be clarified further. Perhaps misunderstanding the question biased the response to yes for this group. However, since there is a difference in races between those reporting SRCS and those reporting HSEMF, the race association with HSEMF could be real. Finally, the association with low income is rather striking. The difference with those reporting SRCS confirms that it is specifically linked to reporting HSEMF . Low education and having no health plan were associated with crude POR but disappeared after using multivariate analysis. No explanation could be found for the association with low income.

Perception of plausible risk from EMF sources was found associated with HSEMF particularly for hair dryer and to a lesser extent for distribution lines. The association of risk perception from EMF with HSEMF demonstrates the influence of perception of risk

that has already described for other symptoms (24,25). But the persistence of the previous identified associated risk factors when taking into account this possible confounder tends to support the fact that self-perceived HSEMF is not explained by the perception of risk.

## CONCLUSION

Hypersensitivity to EMF has been mainly described in Europe. This is the first study to evaluate this problem in North America. Based on a population telephone survey, we found that about 3 percent of the California adult population self-report being sensitive to sources of EMF as power lines, computers or electrical appliances. While no clinical confirmation of the reported symptoms was available, it supports that at least this perception is of public health importance in California and perhaps in North America. The cause of this perceived disorder is not known (1, 14). While some relation to EMF exposure may exist, there are some evidence of an important psychological component associated with this disorder, particularly for those reporting general symptoms (6). Characteristics of people reporting hypersensitivity to EMF are generally different from those reporting chemical sensitivity. This supports that this self-reported disorder merits to be studied further.

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Table 1. General Characteristics of the 2072 Respondents of the 1998 EMF California Study Compared with 1990 California Population

| Characteristics | | Sample | | California |
|---|---|---|---|---|
| | | N | % | % |
| Age, Years | 18-24 | 219 | 10.6 | 15.7 |
| | 25-34 | 486 | 23.5 | 25.6 |
| | 35-44 | 521 | 25.1 | 21.0 |
| | 45-54 | 345 | 16.7 | 13.1 |
| | 55-64 | 214 | 10.3 | 10.1 |
| | ≥ 65 | 287 | 13.9 | 14.2 |
| Gender | Male | 913 | 44.1 | 49.6 |
| | Female | 1159 | 55.9 | 50.4 |
| Race | White | 1251 | 60.4 | 61.4 |
| | Hispanic | 525 | 25.3 | 22.4 |
| | Black | 111 | 5.4 | 6.7 |
| | Other | 185 | 8.9 | 9.4 |

Table 2. Comparison of Characteristics of Subjects Reporting Hypersensitivity to EMF (HSEMF) to those not Reporting it among People Reporting Chemical Sensitivity (CS)

| | HSEMF (N=41) | | CS (without HSEMF) N=446 | | PValues |
|---|---|---|---|---|---|
| | N | % | N | % | |
| **Socio-demographic characteristics** | | | | | |
| **Age,** Years | | | | | |
| 18-24 | 4 | 9.8 | 44 | 9.9 | 0.363 |
| 25-34 | 11 | 26. | 95 | 21.3 | |
| 35-44 | 11 | 26.8 | 104 | 23.3 | |
| 45-54 | 7 | 17.1 | 78 | 17.5 | |
| 55-64 | 1 | 2.4 | 67 | 15.0 | |
| >65 | 7 | 17.1 | 58 | 13.0 | |
| **Gender** | | | | | |
| Male | 15 | 36.6 | 130 | 29.1 | 0.055 |
| Female | 26 | 63.4 | 316 | 70.8 | |
| **Race/Ethnicity** | | | | | |
| White | 9 | 21.9 | 233 | 52.2 | 0.001 |
| Black | 2 | 4.9 | 32 | 7.2 | |
| Hispanic | 18 | 43.9 | 142 | 31.8 | |
| Other | 12 | 29.3 | 39 | 8.7 | |
| **Education** | | | | | |
| < 12 years | 14 | 35.0 | 87 | 19.5 | 0.114 |
| High School Graduate | 11 | 27.5 | 127 | 28.5 | |
| Some college or Technical | 6 | 15.0 | 109 | 24.5 | |
| University Graduate | 9 | 22.5 | 122 | 27.4 | |
| **Employment Status** | | | | | |
| Employed | 20 | 20.0 | 219 | 54.9 | 0.06 |
| Out of Work | 4 | 10.0 | 23 | 5.8 | |
| Not Searching | 11 | 27.5 | 141 | 35.3 | |
| Unable | 5 | 12.5 | 16 | 4.0 | |

Table 2 (continued)

| | | | | | |
|---|---|---|---|---|---|
| **Income (K$)** | | | | | |
| < 15 | 16 | 41.0 | 109 | 26.7 | 0.055 |
| 15-24 | 10 | 25.6 | 69 | 16.9 | |
| 25-49 | 6 | 15.4 | 109 | 26.7 | |
| ≥ 50 | 7 | 17.9 | 121 | 29.7 | |
| **Health Plan** | | | | | |
| Yes | 22 | 53.7 | 339 | 76.7 | 0.001 |
| No | 19 | 46.3 | 103 | 23.3 | |
| **Disease History** | | | | | |
| **Asthma** | | | | | |
| Yes | 6 | 14.6 | 126 | 28.2 | 0.060 |
| No | 35 | 85.4 | 320 | 71.7 | |
| **Hay Fever** | | | | | |
| Yes | 03 | 73.2 | 324 | 72.6 | 1.00 |
| No | 11 | 26.8 | 122 | 27.3 | |
| **MCS Diagnosis** | | | | | |
| Yes | 10 | 24.4 | 37 | 8.3 | 0.001 |
| No | 31 | 75.6 | 408 | 91.7 | |

Table 3. Comparison of Characteristics of Subjects Reporting Hypersensitivity to EMF (HSEMF) to those Reporting Chemical Sensitivity (CS).

| | HSEMF (N=68) | | CS HSEMF N=446 | | PValues |
|---|---|---|---|---|---|
| | N | % | N | % | |
| **Socio-demographic characteristics** | | | | | |
| **Age,** Years | | | | | |
| 18-24 | 8 | 11.8 | 44 | 9.9 | 0.419 |
| 25-34 | 16 | 23.5 | 95 | 21.3 | |
| 35-44 | 17 | 25.0 | 104 | 23.3 | |
| 45-54 | 11 | 16.2 | 78 | 17.5 | |
| 55-64 | 4 | 5.9 | 67 | 15.0 | |
| >65 | 12 | 17.6 | 58 | 13.0 | |
| **Gender** | | | | | |
| Male | 28 | 41.2 | 130 | 29.1 | 0.045 |
| Female | 40 | 58.8 | 316 | 70.8 | |
| **Race/Ethnicity** | | | | | |
| White | 19 | 28.4 | 233 | 52.2 | 0.001 |
| Black | 2 | 3.0 | 32 | 7.2 | |
| Hispanic | 31 | 46.3 | 142 | 31.8 | |
| Other | 15 | 22.4 | 39 | 8.7 | |
| **Education** | | | | | |
| < 12 years | 23 | 33.8 | 88 | 19.7 | 0.094 |
| High School Graduate | 15 | 22.1 | 106 | 23.4 | |
| Some college or Technical | 15 | 22.1 | 130 | 29.1 | |
| University Graduate | 15 | 22.1 | 122 | 27.3 | |
| **Employment Status** | | | | | |
| Employed | 30 | 45.4 | 219 | 54.9 | 0.011 |
| Out of Work | 5 | 736 | 23 | 5.8 | |
| Not Searching | 22 | 33.3 | 141 | 35.3 | |
| Unable | 9 | 13.6 | 16 | 0.4 | |

Table 3 (continued)

| | | | | | |
|---|---|---|---|---|---|
| **Income (K$)** | | | | | |
| < 15 | 26 | 41.3 | 109 | 26.7 | 0.029 |
| 15-24 | 14 | 22.2 | 69 | 16.9 | |
| 25-49 | 12 | 19.1 | 109 | 26.7 | |
| ≥ 50 | 11 | 17.5 | 121 | 29.7 | |
| **Health Plan** | | | | | |
| Yes | 42 | 61.8 | 339 | 76.7 | 0.008 |
| No | 26 | 28.2 | 103 | 23.3 | |
| **Disease History** | | | | | |
| **Asthma** | | | | | |
| Yes | 9 | 13.2 | 126 | 28.3 | 0.008 |
| No | 59 | 88.8 | 320 | 71.8 | |
| **Hay Fever** | | | | | |
| Yes | 42 | 61.8 | 324 | 72.6 | 0.084 |
| No | 26 | 38.2 | 122 | 27.4 | |
| **MCS Diagnosis** | | | | | |
| Yes | 13 | 19.1 | 37 | 8.3 | 0.013 |
| No | 55 | 80.9 | 408 | 91.7 | |

Table 4 Factors Associated with Perceived Electrical Hypersensitivity

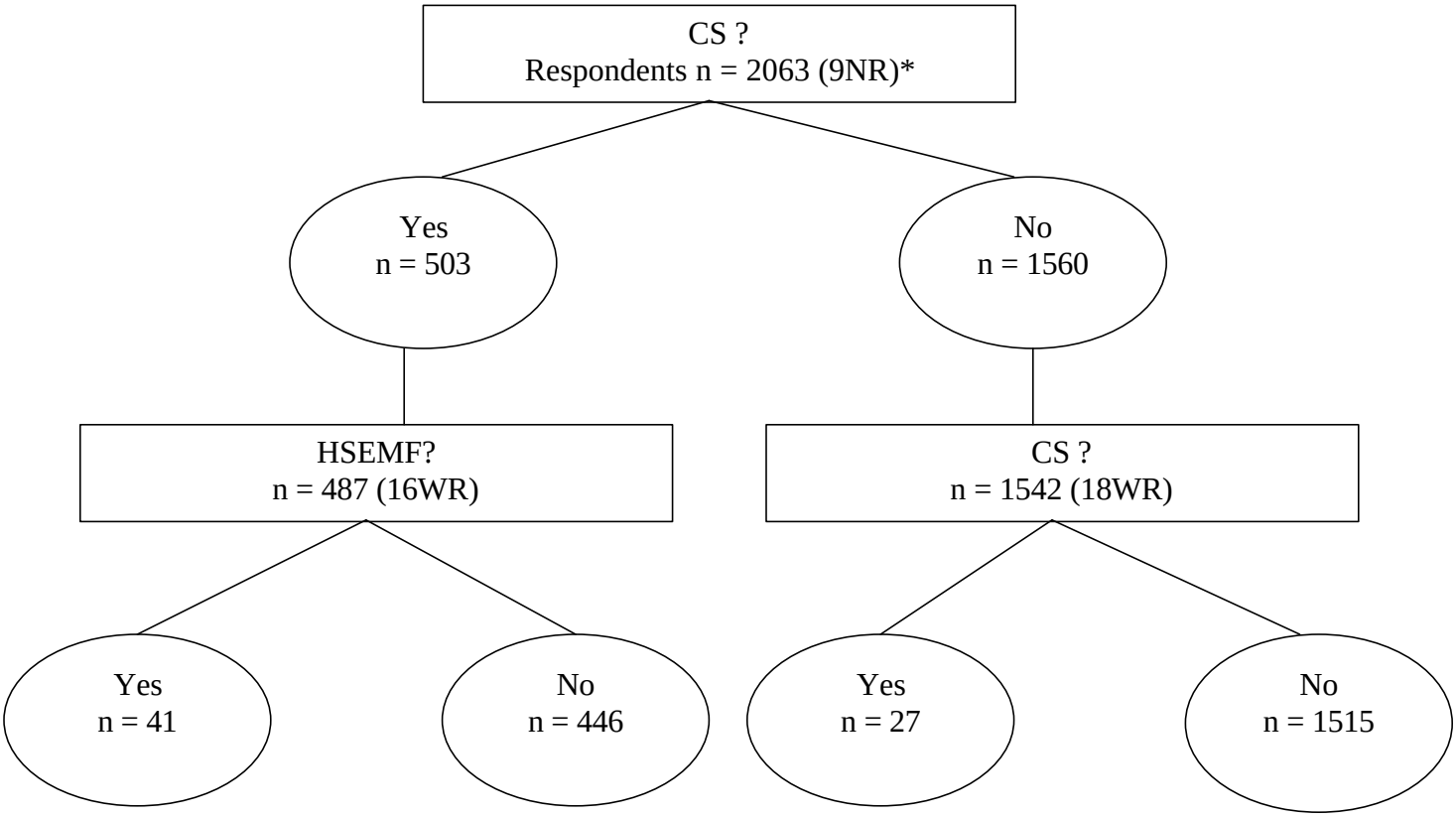
| | $POR_c$ (95%CI) | $POR_{adj}$ (95%CI) |
|---|---|---|
| **Socio-demographic characteristics** | | |
| **Gender** | | |
| Female (n=1139) | 1.13 (0.69 – 1.85) | 0.68 (0.38 – 1.2) |
| **Race/Ethnicity** | | |
| White (n=1230) | 1 | 1 |
| Black (n=109) | 1.80 (0.52 – 6.19) | 1.19 (0.31 – 4.57) |
| Hispanic (n=517) | 4.07 (2.27 – 7.27) | 1.99 (0.93 – 4.29) |
| Others (n=181) | 5.76 (2.87 – 11.55) | 4.94 (2.28 – 10.7) |
| **Education** | | |
| University (n=731) | 1 | 1 |
| 12 years of some college (n=1019) | 1.45 (0.77 – 2.71) | 0.92 (0.45 – 1.86) |
| < 12 years (n=283) | 1.02 (2.06 – 7.87) | 1.31 (0.53 – 3.26) |
| **Employment Status** | | |
| Employed (n=1333) | 1 | 1 |
| Out of work/not working (n=640) | 1.79 (1.06 – 3.01) | 1.65 (0.86 – 3.15) |
| Unable to work (n=61) | 7.04 (3.19 – 15.50) | 3.79 (1.39 – 10.7) |
| **Family Income (K$/year)** | | |
| ≥ 25 (n=1288) | 1 | 1 |
| 15-24 (n=262) | 3.10 (1.57 – 6.12) | 2.18 (1.00 – 4.75) |
| < 15 (n=331) | 4.09 (2.64 – 8.33) | 2.43 (1.13 – 5.24) |
| **Healthplan** | | |
| No (n=373) | 2.88 (1.74 – 4.77) | 1.07 (0.55 – 2.00) |
| **Disease Status** | | |
| Asthma (n=281) | 0.95 (0.47 – 1.94) | 0.35 (0.14 – 0.87) |
| Hay Fever (n=1015) | 1.65 (1.00 – 2.71) | 1.42 (0.78 – 0.20) |
| Self Reported Chemical Sensitivity (n=487) | 5.16 (3.14 – 8.48) | 3.63 (1.98 – 6.67) |
| Physician Diagnosed Chemical Sensitivity (n=73) | 7.50 (3.89 – 1447) | 5.80 (2.61 – 12.8) |

$POR_c$ = Crude Prevalence Odd's Ratio
$POR_{adj}$ = Adjusted Prevalence Odd's Ratio

Table 5 Factors Associated with Self Perceive Electrical Hypersensitivity with Adjustment for EMF Risk Perception

| | For Powerline Risk Perception | For Distribution Risk Perception | For Hair Dryer Risk Perception |
|---|---|---|---|
| **Age** | | | |
| **Gender** | | | |
| Female | 0.70 (0.36 – 1.35) | 0.60 (0.31 – 1.1) | 0.77 (0.39 – 1.52) |
| **Race** | | | |
| White | 1 | 1 | 1 |
| Black | 1.26 (0.31 – 5.03) | 1.43 (0.36 – 5.74) | 1.15 (0.28 –4.7) |
| Hispanic | 2.18 (0.92 – 5.15) | 2.76 (1.22 – 6.22) | 1.68 (0.68 – 4.15) |
| Others | 5.61 (2.47 – 12.77) | 5.82 (2.57 – 13.20) | 4.48 (1.91 – 10.5) |
| **Education** | | | |
| University | 1 | 1 | 1 |
| 12 years of some college | 0.73 (0.34 – 1.57) | 0.64 (0.30 – 1.34) | 0.84 (0.38 – 1.85) |
| < 12 years | 1.01 (0.34 – 3.01 | 0.59 (0.33 – 1.1) | 1.02 (0.33 – 3.14) |
| **Employment Status** | | | |
| Employed | 1 | 1 | 1 |
| Out of Work/Not Working | 1.65 (0.80 – 3.40) | 2.07 (1.04 – 4.09) | 1.60 (0.77 – 3.35) |
| Unable to Work | 3.68 (1.22 – 11.12) | 3.72 (1.23 – 11.22) | 3.33 (1.07 – 10.33) |
| **Family Income (K$/year)** | | | |
| ≥ 25 (n=1288) | 1 | 1 | 1 |
| 15-24 (n=262) | 1.92 (0.77 – 4.83) | 2.94 (1.34 – 6.48) | 1.52 (0.58 – 3.99) |
| < 15 (n=331) | 3.56 (1.54 – 8.20) | 2.62 (1.17 – 5.88) | 3.00 (1.28 – 6.99) |
| **Healthplan** | | | |
| No | 1.03 (0.48 – 2.21) | 1.02 (0.52 – 2.02) | 1.07 (0.50 – 2.30) |
| **Disease Status** | | | |
| Asthma | 0.35 (0.13 – 0.95) | 0.28 (0.11 – 0.74) | 0.40 (0.15 – 1.06) |
| Hay Fever | 1.31 (0.67 – 2.54) | 1.61 (0.86 – 3.02) | 1.36 (0.69 – 2.69) |
| Self Reported Chemical Sensitivity | 3.67 (1.84 – 7.26) | 3.63 (1.91 – 6.90) | 3.36 (1.67 – 6.76) |
| Physician-diagnosed Chemical Sensitivity | 4.70 (1.81 – 12.18) | 5.86 (2.49 – 13.76) | 5.21 (2.03 – 13.6) |
| **Risk Perception** | | | |
| Powerline | 1.49 (0.74 – 2.99) | | |
| Distribution Line | | 1.97 (0.99 – 3.94) | |
| Hair Dryer | | | 2.46 (1.24 – 4.88) |

Figure 1
Answer to questions regarding chemical sensitivity (CS) or hypersensitivity to EMF (HSEMF)




* NR = Non respondents